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Luca Tesei et al.

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1 Introduction

Java programs are compiled into an intermediate language which is interpreted by the Java Virtual Machine (JVM in the following) [LY99]. The intermediate language, which, following other authors, we call JVMML, is a language of bytecode instructions.

Since JVMML programs can be loaded from the network, security problems may arise. For this reason, JVM embodies a bytecode verifier which performs a set of checks on JVMML programs before their execution. The aim of these checks is to prevent the execution of malicious or wrong code which could corrupt the integrity of the host. In particular, the verifier performs a data-flow analysis applied to a type-level abstract interpretation of the JVM. We refer to this verifier as the standard one and to its verification as the standard verification.

Given the importance of the bytecode verifier, a lot of research efforts have been dedicated both to its formalization [SA99, FM99] and to study extensions able to accept larger classes of correct programs than the standard verifier does [HT98, O'C99].

Finally [PD05] is very interesting from economic point of view [RT].

References

- [FM99] S. N. Freund and J. C. Mitchell. A formal framework for the java bytecode language and verifier. In *Proceedings of 15th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA'99)*, pages 147–166. ACM Press, 1999.
- [HT98] M. Hagiya and A. Tozawa. On a new method for dataflow analysis of java virtual machine subroutines. In *Proceedings of the 5th International Symposium on Static (SAS'98)*, number 1503 in Lecture Notes on Computer Science, pages 17–32, Berlin, 1998. Springer.
- [LY99] T. Lindholm and F. Yellin. *The Java Virtual Machine Specification. Second Edition*. The Java Series. Addison-Wesley, 1999.

- [O'C99] Robert O'Callahan. A simple, comprehensive type system for java byte-code subroutines. In *Proceedings of the 26th ACM SIGACT-SIGPLAN symposium on Principles of Programming Languages (POPL'99)*, pages 70–78. ACM Press, 1999.
- [PD05] P. Papérino and P. De Paperoni. Rich forever. *Walt Disney Journal*, 1(3–4):300–444, 2005.
- [RT] Pippo Pluto Aóojiofjs Rossi and Luca Tesei. *Ciao*.
- [SA99] R. Stata and M. Abadi. A type system for java bytecode subroutines. *ACM Transactions on Programming Languages and Systems*, 21(1):90–137, 1999.